



10th MOUNTAIN DIVISION (LI) AND FORT DRUM

Training Maneuver Corridor Analysis on Fort Drum Military Installation

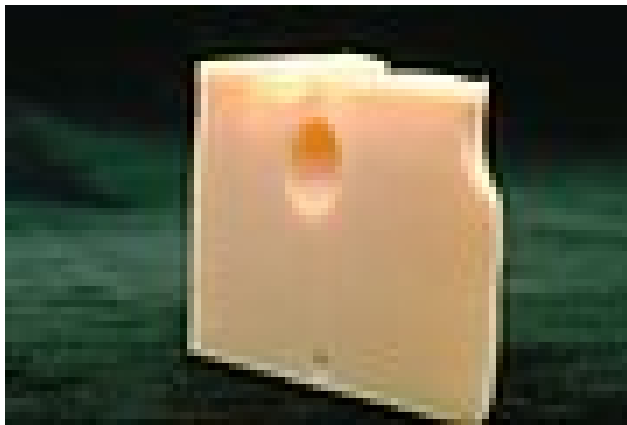
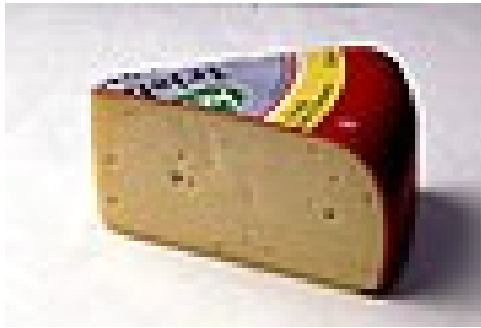
Presented by:

**Ian Warden, LRAM Coordinator and
Jim Rapant, GIS Analyst**

**A Geographic Information System and ground-truthing
was used to locate training maneuver corridors on
Fort Drum Military Installation, New York. The starting
and ending points of three corridors were selected.**

**Least-cost pathway calculations between the points were based on
from a cross-country movement model that generates vehicle speed
affected by slope, ground surface curvature, ground surface roughness,
soil, and vegetation. Ground surveys were carried out to verify the
trafficability of the corridors and validate the cross-country movement**





HMMWV mobility under wet conditions

1 0 1 2 Kilometers



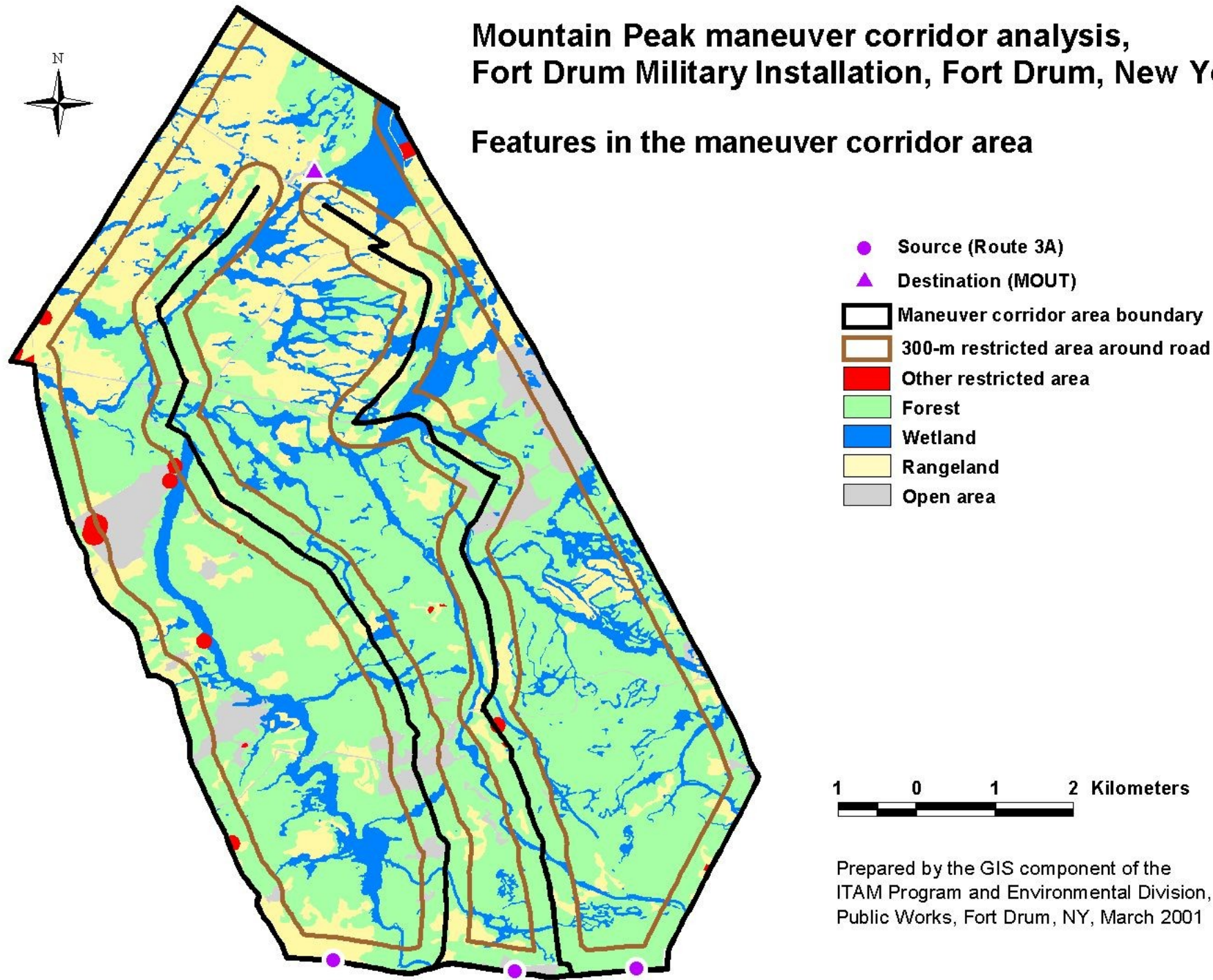
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August, 2000

Cross-country movement model accounted for

- Slope
- Ground surface curvature
- Ground surface roughness
- Soil
- Vegetation

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Features in the maneuver corridor area



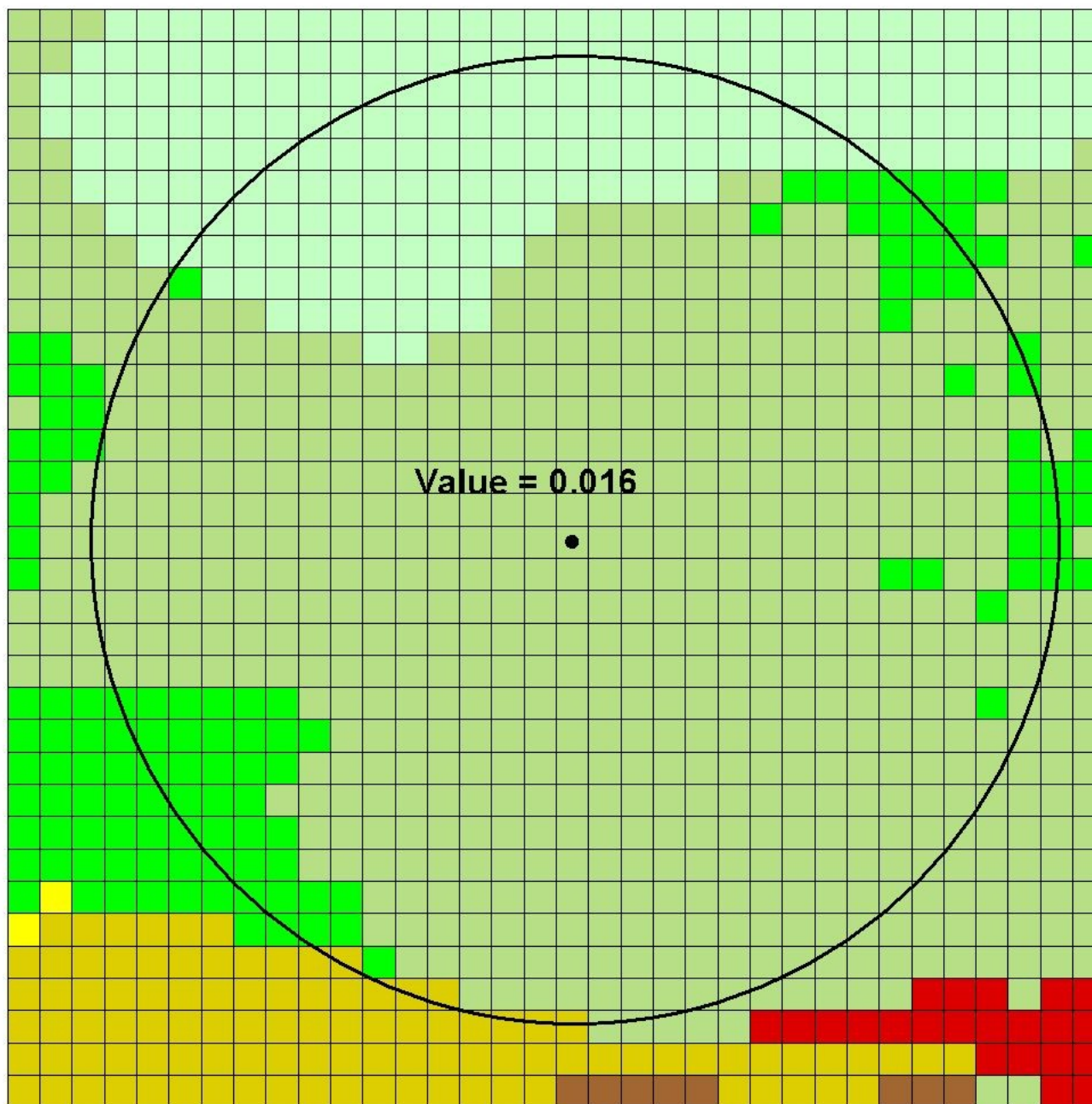
Sample resistance values for 300-m corridor analysis

- 10 x 10 m raster cell
- Sample cell with value
- 150-m radius around sample cell

Raster cell values:



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Sample average resistance value assignment for 300-m corridor analysis

- 10 x 10 m raster cell
- Sample cell with value
- 150-m radius around sample cell
- ↯ Edge of 300-m corridor
- ↯ Center-line of 300-m corridor

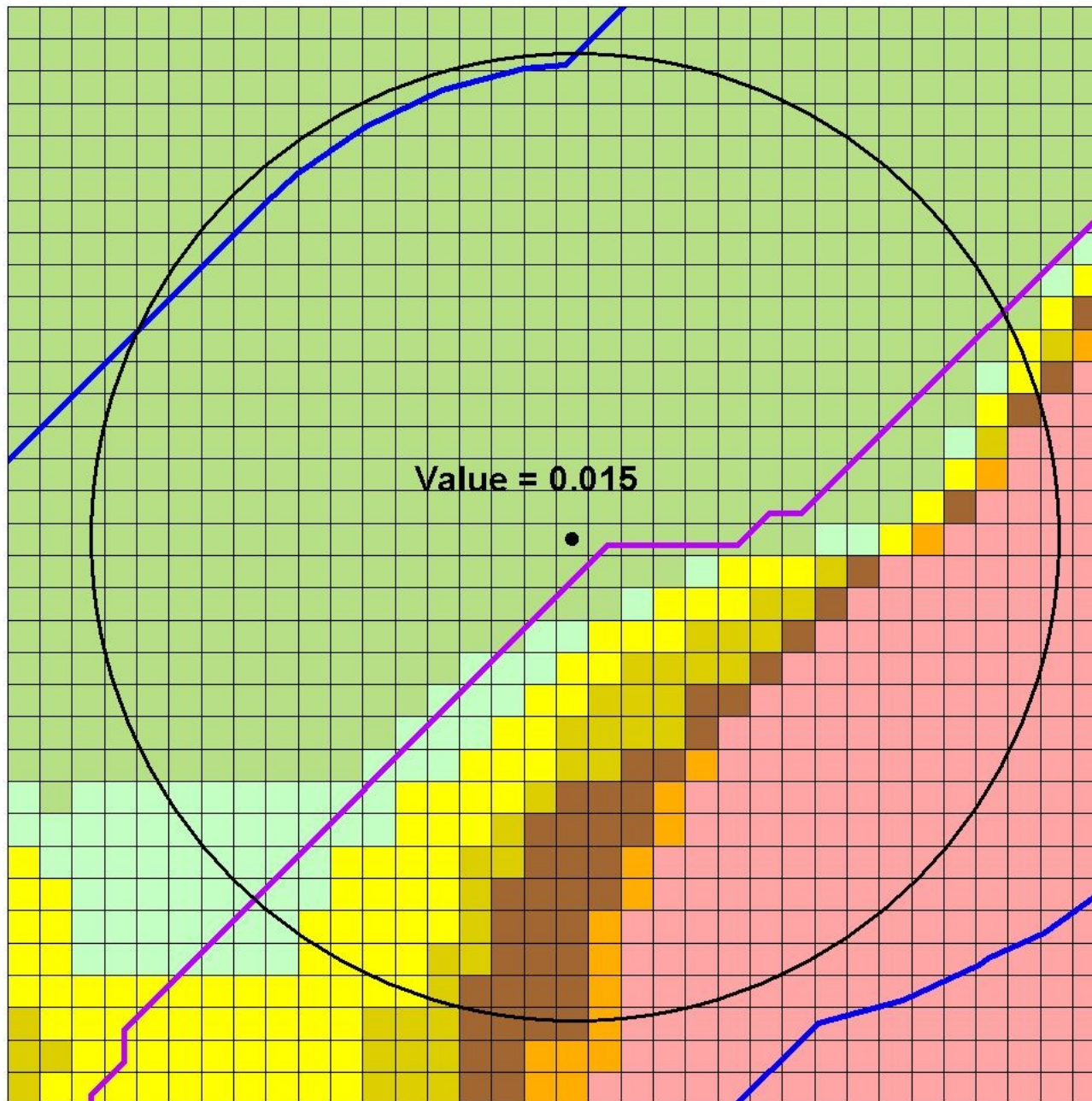
Raster cell values:

- 0.1000 - 0.5000
- 0.0300 - 0.1000
- 0.0275 - 0.0300
- 0.0250 - 0.0275
- 0.0225 - 0.0250
- 0.0200 - 0.0225
- 0.0175 - 0.0200
- 0.0150 - 0.0175
- 0.0125 - 0.0150
- 0.0100 - 0.0125



20 0 20 40 60 80 Meters

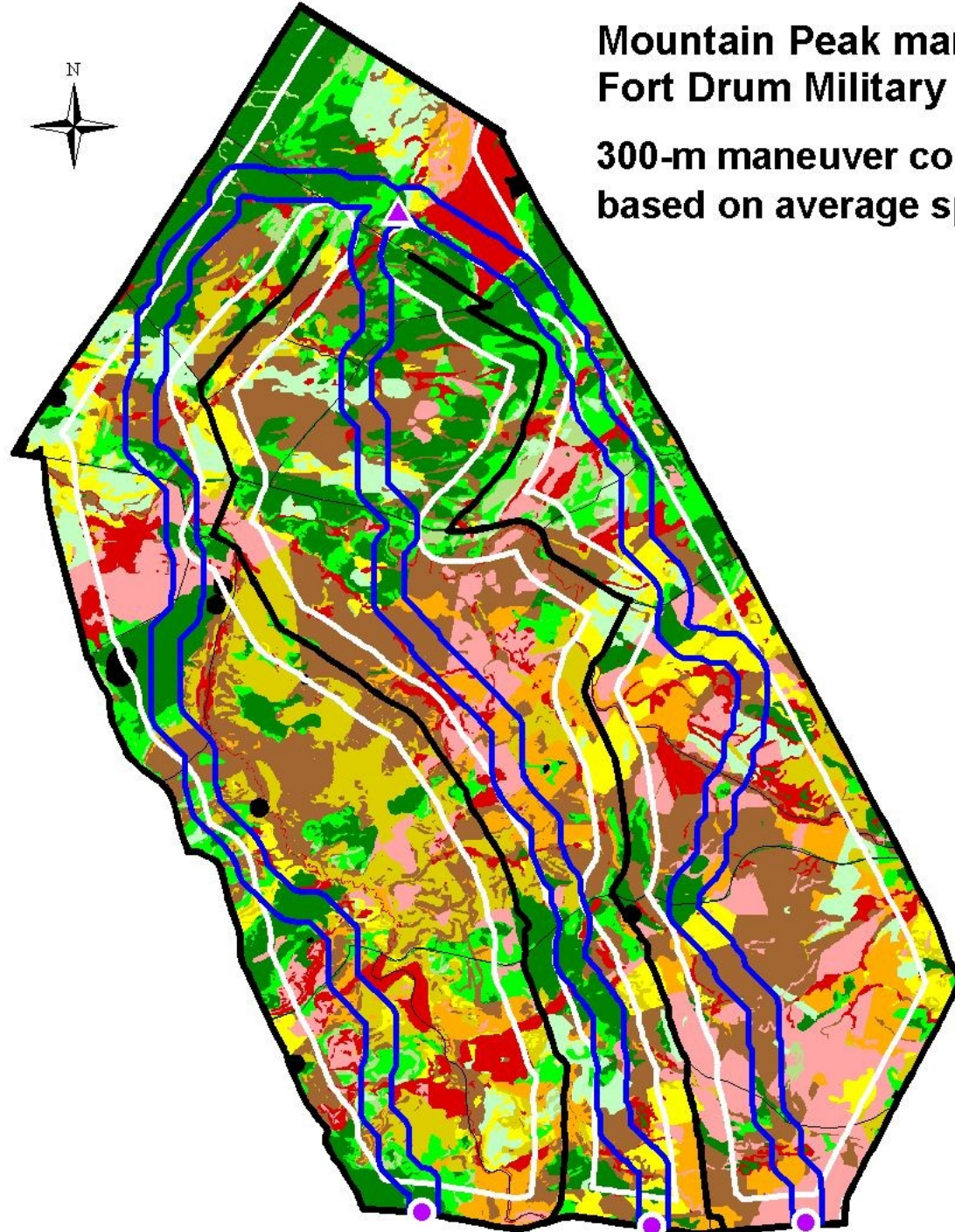
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300-m maneuver corridors over speed layer,
based on average speed value within 150 m



- Source (Route 3A)
- ▲ Destination (MOUT)
- ▭ 300-m corridor
- Maneuver area boundary
- Restricted area 300 m from road
- Restricted vehicular access
- Subtraining area boundary
- < 2 kph (Extremely slow)
- 2 - 4 kph (Very slow)
- 4 - 6 kph (Very slow)
- 6 - 10 kph (Slow)
- 10 - 14 kph (Slow)
- 14 - 20 kph (Restricted)
- 20 - 26 kph (Restricted)
- 26 - 32 kph (Unrestricted)
- 32 - 40 kph (Unrestricted)
- > 40 kph (Unrestricted)

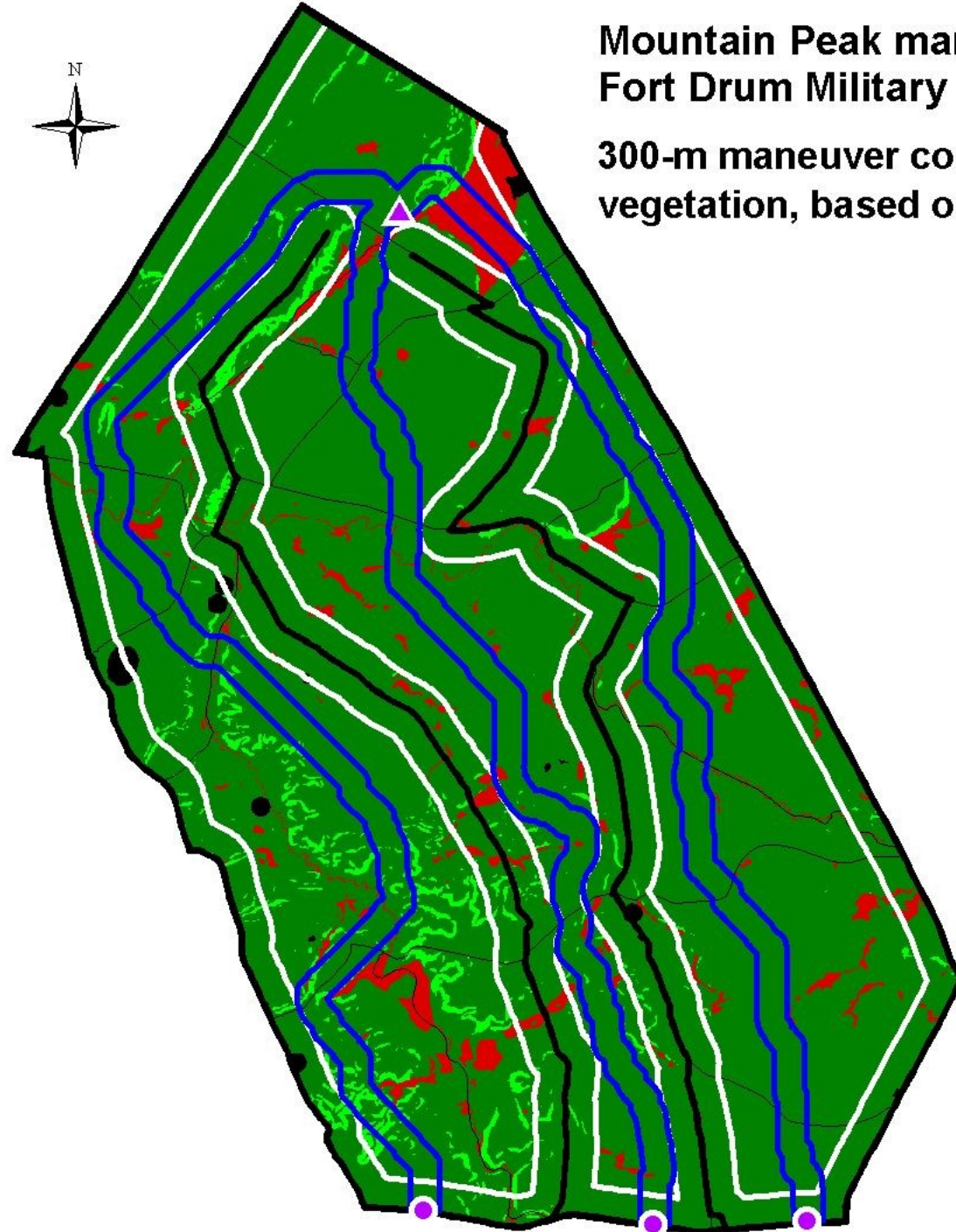
1 0 1 2 Kilometers

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300-m maneuver corridors over speed layer, excluding
vegetation, based on average speed value within 150 m



- Source (Route 3A)
- ▲ Destination (MOUT)
- ▭ 300-m corridor
- Maneuver area boundary
- Restricted area 300 m from road
- Restricted vehicular access
- Subtraining area boundary
- < 2 kph (Extremely slow)
- 2 - 4 kph (Very slow)
- 4 - 6 kph (Very slow)
- 6 - 10 kph (Slow)
- 10 - 14 kph (Slow)
- 14 - 20 kph (Restricted)
- 20 - 26 kph (Restricted)
- 26 - 32 kph (Unrestricted)
- 32 - 40 kph (Unrestricted)
- > 40 kph (Unrestricted)

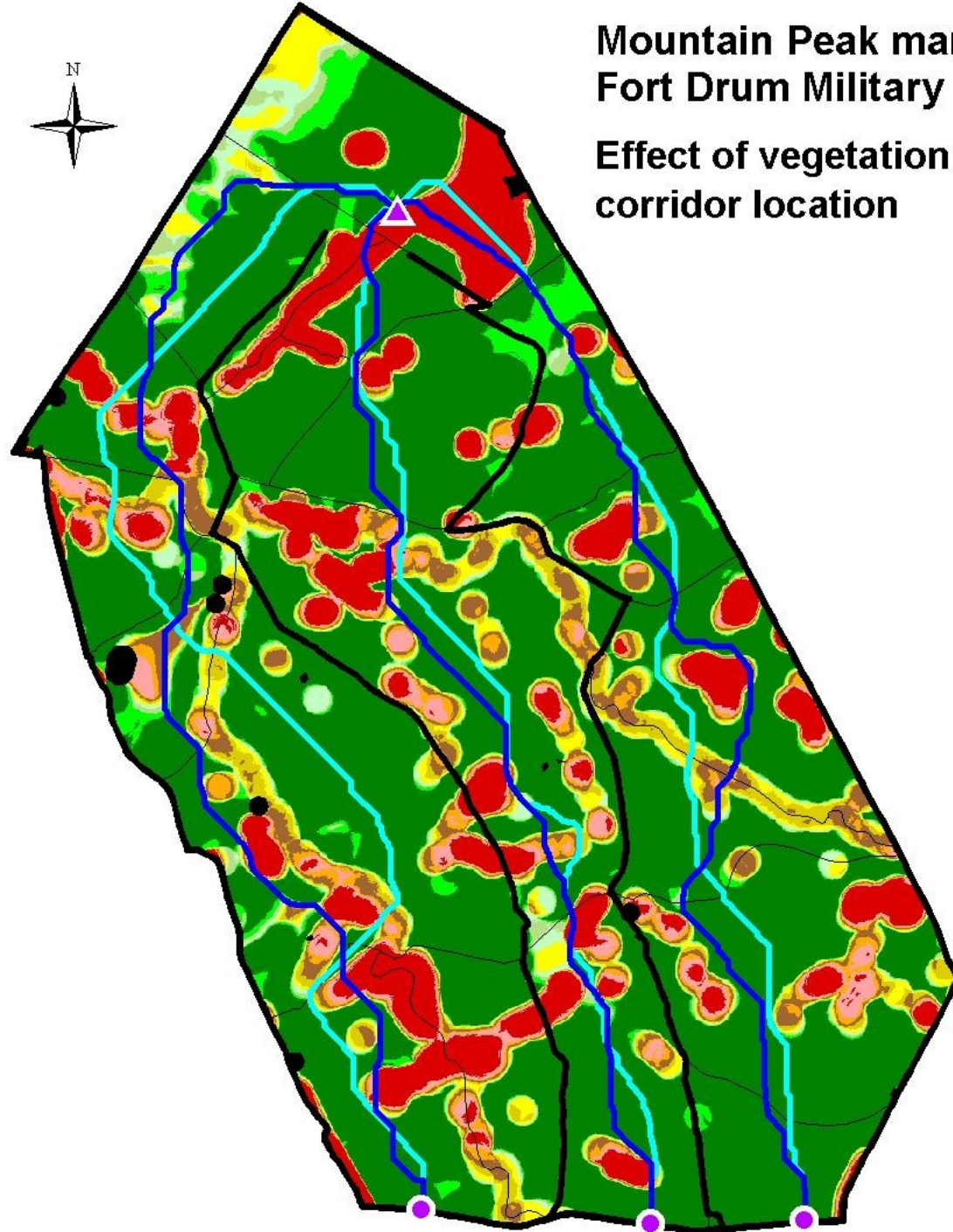
1 0 1 2 Kilometers

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Effect of vegetation removal on 300-m maneuver corridor location



- Source (Route 3A)
- ▲ Destination (MOUT)
- 300-m corridor, with vegetation
- 300-m corridor, without vegetation
- Maneuver area boundary
- Restricted vehicular access
- Subtraining area boundary

Speed increase after vegetation removal:

- < 2 kph increase
- 2 - 4 kph increase
- 4 - 6 kph increase
- 6 - 10 kph increase
- 10 - 14 kph increase
- 14 - 20 kph increase
- 20 - 26 kph increase
- 26 - 32 kph increase
- 32 - 40 kph increase
- > 40 kph increase

1 0 1 2 Kilometers

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400-m maneuver corridors center-line
over true-color digital aerial photos

- Source (Route 3A)
- ▲ Destination (MOUT)
- ↯ Maneuver area boundary
- ↯ 400-m corridor center-line

1 0 1 2 Kilometers

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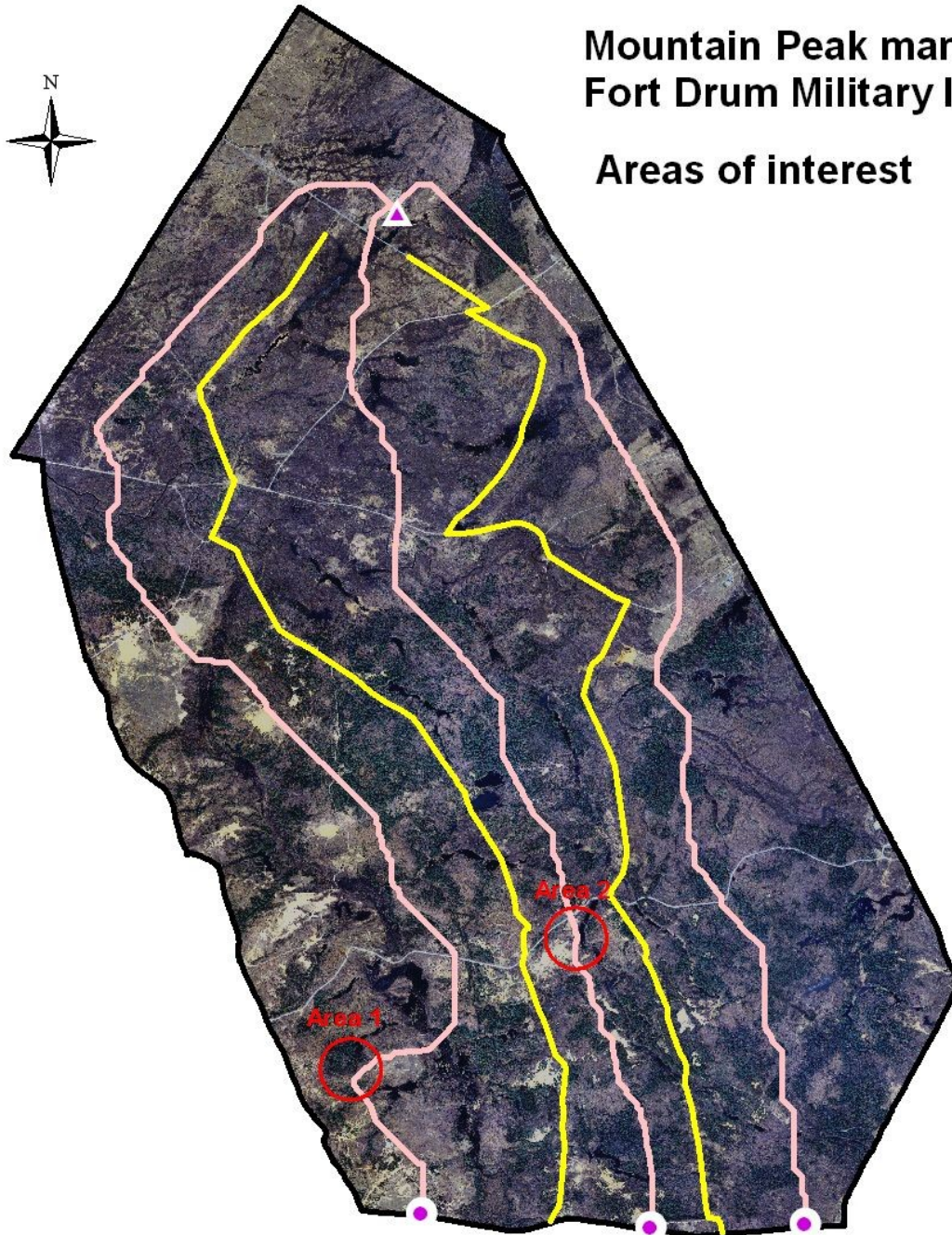
Areas of interest



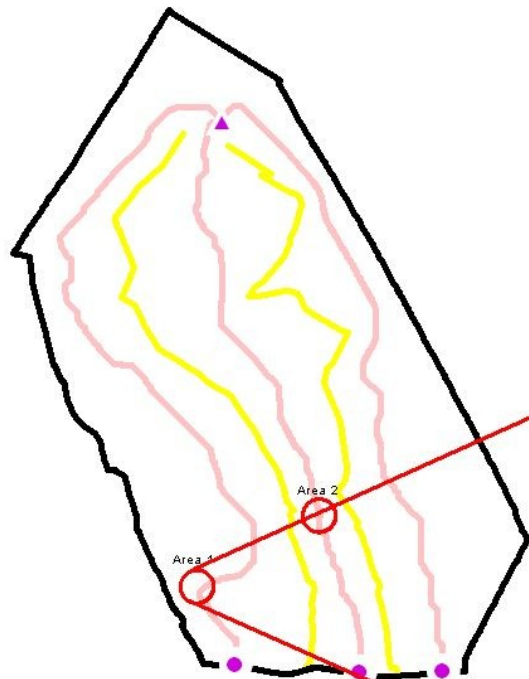
- Source (Route 3A)
- ▲ Destination (MOUT)
- ↯ Maneuver area boundary
- ↯ 400-m corridor center-line
- Areas of Interest

1 0 1 2 Kilometers

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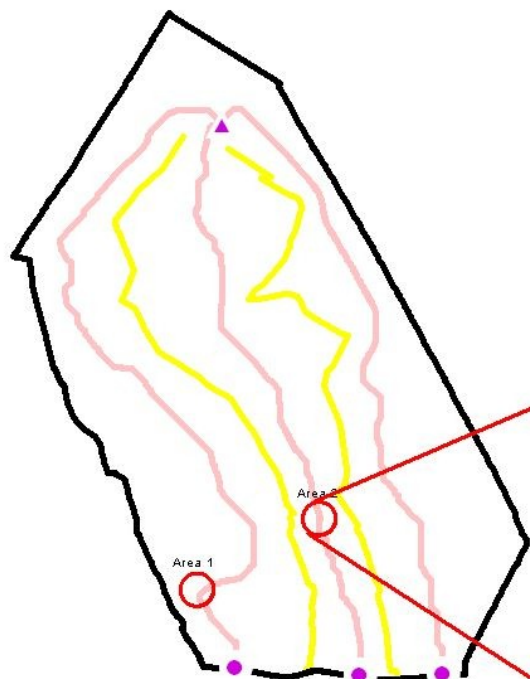


- Source (Route 3A)
- ▲ Destination (MOUT)
- Maneuver area boundary
- Areas of Interest
- 400-m corridor center-line



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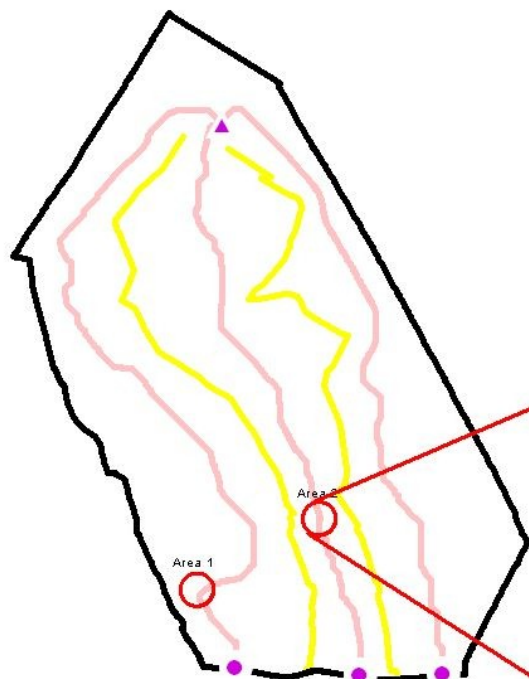


- Source (Route 3A)
- ▲ Destination (MOUT)
- Maneuver area boundary
- Areas of Interest
- 400-m corridor center-line



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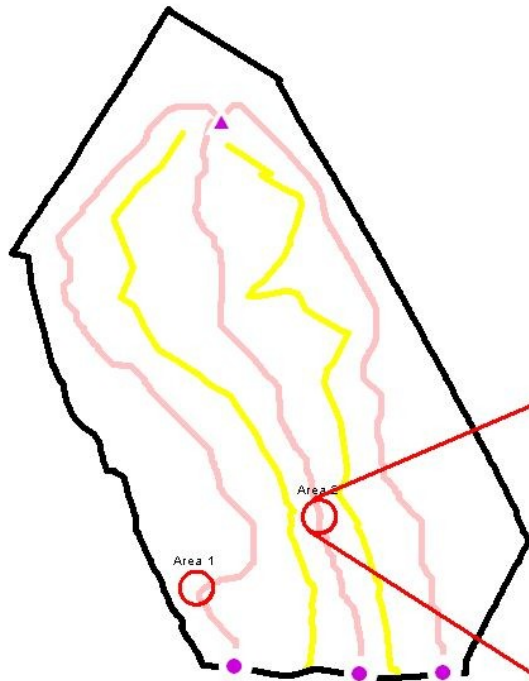


- Source (Route 3A)
- ▲ Destination (MOUT)
- Maneuver area boundary
- Areas of Interest
- 300-m buffer for maneuver area boundary
- 400-m corridor center-line

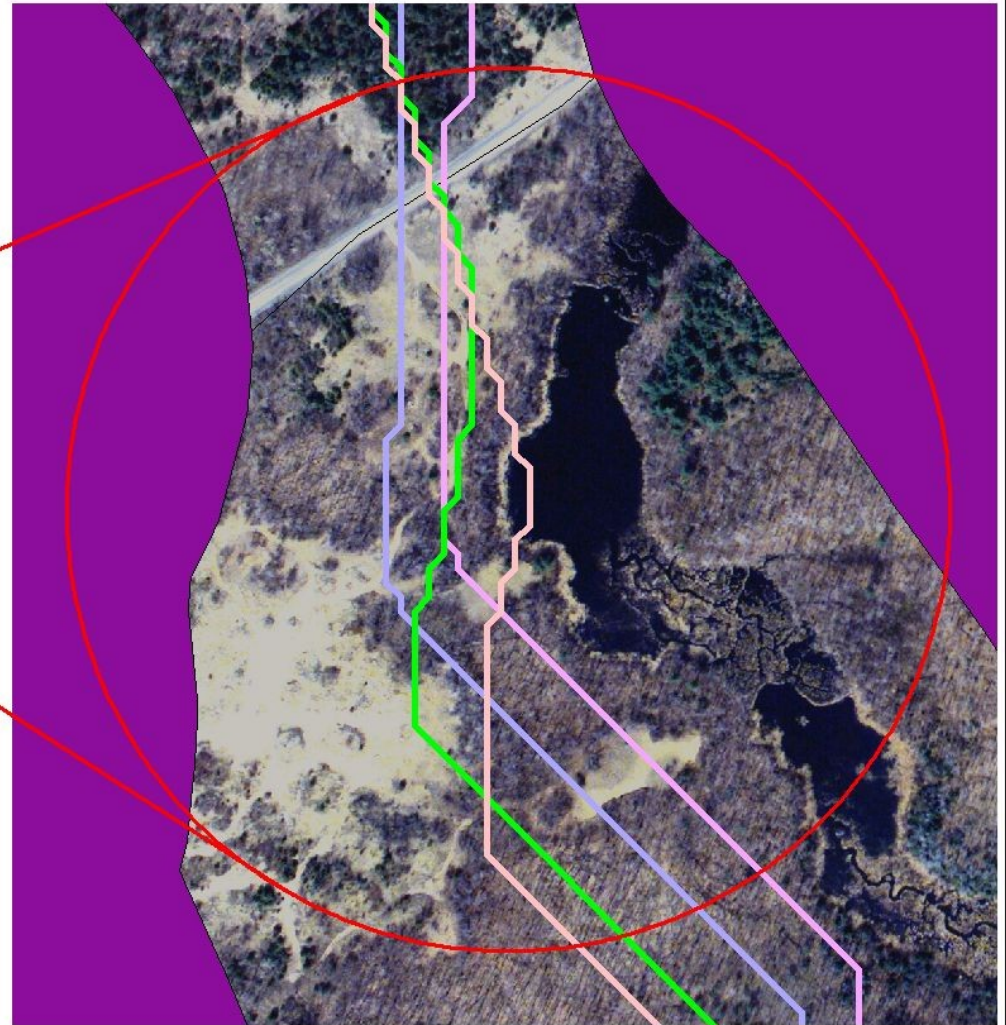


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- Source (Route 3A)
- ▲ Destination (MOUT)
- Maneuver area boundary
- Areas of Interest
- 300-m buffer for maneuver area boundary
- 400-m corridor center-line
- 300-m corridor center-line
- 200-m corridor center-line
- 100-m corridor center-line



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Cross country movement
model develops
demonstration corridor
in timber sale unit

100 0 100 200 300 Meters


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